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Forest
Service

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Subject: Dwarf Mistletoe Infections In Pine Plantations Within The 1987
Stanislaus Complex Fire (FPM Report No. C97-4)

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Abstract

Several thousand acres of ponderosa pine plantations within the 1987 Stanislaus Complex Fire are currently infected with western dwarf mistletoe. The Groveland Ranger District has already surveyed and mapped the infected residual trees and plans to move ahead with suppression treatments. The Sonora FPM office supports this project and will provide guidance for submitting a suppression project proposal for FY 98 and implementing it if funded.

On October 17, 1997, I visited several sites within the 1987 Stanislaus Complex Fire on the Groveland Ranger District, Stanislaus National Forest. Ken Ostrom, with the District Silviculture Staff, accompanied me. The purposes of this evaluation were to review the results of completed presuppression surveys, confirm the status of dwarf mistletoe infestations, and discuss possible actions to implement suppression treatments.

The district received Forest Pest Management suppression dollars in FY 93 to survey the Stanislaus Complex Fire and locate and map dwarf mistletoe infected trees. A thorough survey was completed with very detailed maps showing the locations of all infected pines on almost 10,000 acres. They found mistletoe in and adjacent to plantations established before and after the 1987 fire. Individual tree infections varied from slight to severe using the Hawksworth rating system. Most of the plantation pines under 10 years of age are still uninfected, and it is important to promptly remove the infected residual trees before mistletoe can spread from them to the younger pines.

This is actually a continuing suppression project although several years have passed since pre-suppression surveys were completed. Groveland District personnel are familiar with the biology of dwarf mistletoe and approaches to control because of previous FPM funded projects. A general discussion of and guidelines for treatment of this pest are attached.

In the present situation, most suppression will be accomplished through tree removal or girdling, with a very limited amount of pruning. Girdling will be used where standing snags are needed for wildlife purposes. Revenue from the sale of any commercial trees will be used to support the project and reduce FPM needed funding. Suppression dollars are also needed to produce required NEPA documents. An Environmental Impact Statement has been prepared for the

Hamm/Hasloe analysis area, which includes the proposed treatment sites, but it did not address dwarf mistletoe suppression.

Please refer any questions or requests for additional information to John Pronos at (209) 532-3671 X242; J.Pronos:R05F16A.



JOHN PRONOS
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**GUIDELINES FOR THE USE OF FPM FUNDING FOR SUPPRESSION OF
WESTERN DWARF MISTLETOE IN CALIFORNIA RECREATION AREAS**

Suppression Treatments

A number of treatment methods are available for the suppression of dwarf mistletoe in recreation areas. They can be used singly or in combination. The method or methods chosen for a particular site depends heavily upon the management goals for that site. Stand structure and composition and the intensity of the infection should also be considered. Below is a list of alternative treatments which FPM can recommend, and guidelines for their implementation. The direct methods are those which can be funded with FPM suppression funds. In keeping with the theme of integrated pest management, these treatments are designed to promote overall stand vigor by suppressing dwarf mistletoe impact.

Direct Suppression Methods

1. Broom Pruning

Objective: To extend tree life and maintain individual treated trees on a site as long as possible.

Guidelines: Remove dwarf mistletoe witches' brooms from high-value trees only if they will have at least 30% live crown after removal of the brooms. This treatment will not eliminate mistletoe from the stand, nor will it prevent future spread. It is most often used in areas that have little or no understory.

2. Tree Removal

Objective: To remove trees expected to die within ten to fifteen years, to prevent the build-up of bark beetles, and to reduce dwarf mistletoe seed in the stand.

Guidelines: Remove trees with a DMR of 5 or 6, or a rating of 4 with mistletoe in the upper one-third of the crown. Such trees generally are not prunable, pose a threat to adjacent uninfected pines, and have a higher probability of dying within 10 to 15 years or during the next drought. It is also advisable to remove infected pines that will have less than 30 percent live crown after pruning, or are growing in dense aggregations where removal of selected individuals would benefit neighboring uninfected or slightly infected pines. Remove all trees having bole infections at a point less than six inches in diameter. Bole infections are not serious from the standpoint of spreading mistletoe, but they deform and/or lead to mortality of small trees and failure of large trees.

3. Creation of Buffer Strips

Objective: To limit or stop the spread of dwarf mistletoe into a treated area from adjacent infested areas.

Guidelines: Use host-free strips to prevent mistletoe from re-entering the control area or, when the parasite is not eliminated, from leaving the site. Buffer strips should be at least as wide as the height of the highest mistletoe plants in the adjacent infested stand. Examples of existing buffers include meadows, roads, rivers, clearings, and aggregations or plantings of non-host trees. Construction of new roads, structures, or campsites can also be used to create buffer zones and eliminate pockets of heavily infected trees.

4. Branch Pruning/Eradication

Objective: To reduce or eliminate dwarf mistletoe seed in the stand and improve tree vigor.

Guidelines: For trees with DMR of 3 or less, or a rating of 4 and no mistletoe in the upper one-third of the crown, prune all lower branches, both healthy and diseased, at the bole up to and including the second whorl of branches above the highest visible mistletoe infection. Experience has shown that despite removing branches up through the highest infection or even one more whorl, latent infections almost certainly appear in three to five years. Whenever possible, avoid removing more than 50% of a tree's live crown. Pruning of all infected branches in infected trees in an attempt to eradicate this pest requires careful adherence to these guidelines, and will have the greatest chance of success when used on isolated high-value trees or in areas of one acre or less where infection is light. Do not attempt eradication if the pruning will result in a tree with a crown of less than 30%, or if the tree will be exposed to continued infection from adjacent infected trees. It is difficult to completely eliminate dwarf mistletoe from a tree without at least two treatments. Plan to reenter and retreat if needed at least twice after the first entry.

Indirect Suppression Methods

1. Thinning

Objective: To improve stand growth and tree vigor.

Rationale: Despite direct dwarf mistletoe treatment, the benefits from reducing or eliminating infection may be offset by continuing competition for growing space in overcrowded stands. Even where mistletoe is absent, overstocking contributes to poor tree vigor and an unnecessarily high risk of death from bark beetle attack. Although privacy and esthetic requirements in campgrounds may prevent thinning to stocking levels optimum for timber-producing forests, some thinning may be necessary if campground stands are to maintain vigor and resistance to pest attack.

2. Favoring and Planting Non-Host Conifers and Hardwoods

Objective: To eventually replace infected trees with uninfected trees and to lessen future spread of dwarf mistletoe.

Rationale: Because western dwarf mistletoe (*A. campylopodum*) infects neither the hardwoods nor most of the conifers growing with susceptible ponderosa and Jeffrey pines, managers may favor these non-hosts so that they become a larger component of the campground stands. Selected individuals or small aggregations of these non-host species may be retained as buffers to movement of the parasite, or as eventual replacements for severely infected pines that cannot be removed during mistletoe treatment. Wherever there are pure stands of severely infected pines, planting of non-susceptible species may be the only way to ensure that new trees replace the pines that die or are removed. However, for plantings to survive in campgrounds, managers must be prepared to protect them with stakes, fencing, drip irrigation, a visitor information program, and other expensive treatments.

3. Rotation of Campground Usage

Objective: To provide long-term recovery of heavily infested areas.

Rationale: Successful mistletoe treatment and thinning are sometimes incompatible with campground management, and partial treatments are usually not biologically or economically sound. In such cases it may be advisable to close a campground so that treatment can be carried out properly and stands revegetated where necessary. Although closing part or all of a campground for 10 to 15 years may seem impossible in the short run, the advantages that accrue from healthier stands and a greater mix of tree species and ages may offset the temporary loss of the site. Severely infested campground stands will continue to decline until the campgrounds finally must be closed; it may be cheaper to revitalize the stands while possible, rather than wait until the old grounds must be closed and completely regenerated. And, when campgrounds must be closed because of a shortage of money and personnel, managers could select for closure those sites where mistletoe treatment and stand rejuvenation are most needed.

INTEGRATED PEST MANAGEMENT

Dwarf mistletoe is often only part of a larger set of stand, site, and pest factors. Before treatment, each campground should be evaluated thoroughly to ensure that all pests are considered in the management alternative(s) selected. For example, treatment of dwarf mistletoe-infected pines might not be economical in an annosus (*Heterobasidion annosum*) root disease center, due to the high probability of tree mortality. However, if such trees still appear healthy five years after the project is concluded, treatment would then be justified to limit dwarf mistletoe spread from the trees.

When tree removal and pruning does take place, treat all freshly cut stump surfaces with borax to prevent the establishment of *H. annosum*. Also treat

green slash generated by pruning or tree removal to reduce the risk of pine engraver beetle (*Ips* spp.) buildup. Slash created in the spring or early summer should be either lopped and scattered, piled and burned while green, chipped, or removed to a location lacking susceptible hosts.

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